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COMPARATIVE EPIDEMIOLOGY OF THREE MAIZE VIRUSES IN REUNION ISLAND IN RELATION TO THE POPULATION DYNAMIC OF THEIR VECTORS, *CICADULINA MBILA* AND *PEREGRINUS MAIDIS*

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The simultaneous presence of maize streak virus (MSV), maize stripe virus (MStpV) and maize mosaic virus (MMV) in Réunion has enabled us to study their comparative epidemiology.

Symptomatological ratings were taken through three years of culture on weekly sowings of the temperate hybrid INRA 508 and the composite variety IRAT 297.

Fluctuations of emigrant populations of *C. mbila* and *P. maidis* and climatic factors (temperature, rainfall and relative humidity) were measured and analysed by time series and stepwise regression analyses. Streak is the dominant disease, particularly during the warm rainy season and MMV was less frequent. Highest autocorrelations were observed with a time-lag of 12 months, confirming the annual periodicity of the fluctuation.

Pattern of change of insect numbers was positively correlated with the change in disease incidence (correlations ranging from 0.65 to 0.87). Disease incidence and vector numbers always remained constant or increased slowly with temperature up to 24°C and increased rapidly above 24°C. The relationship between rainfall, relative humidity, disease incidence and vector numbers is less clear.

Depending on the series, from 63% to 80% of the variance of disease incidence was explained by the stepwise regression with vector numbers, and (sometimes) temperature, rainfall or relative humidity. Therefore, the close adjustement found between observed and data calculated with the resulting regression allowed us to propose a simple epidemiological model.

Epidemiological data especially from Africa are compared in order to better understand the epidemiology of these viruses. Further work is needed to confirm the validity of the model. The rate of plants infected by the three viruses and the number of *P. maidis* per plant were significantly lower ($P = 0.0001$) on IRAT 297 than on INRA 508. The resistance behavior of IRAT 297 under natural conditions points to its utilization as resistance donor in breeding program geared toward obtaining multi-resistance maize genotypes.